

What is claimed is:

1 1. A system for managing a communication network
2 composed of a plurality of subnetworks, comprising:
3 a plurality of element managers provided one for each
4 of the plural subnetworks; and
5 a network manager accommodating said plural element
6 managers for concentrated management thereof;
7 each of said plural element managers having a
8 collection and notification section for collecting QoS
9 (Quality of Service) capability management information on
10 the corresponding element manager and notifying said
11 network manager of the collected QoS capability management
12 information;
13 said network manager having
14 a management section for concentratedly
15 managing various QoS capabilities of the whole
16 communication network, based on the QoS capability
17 management information collected and notified by the
18 individual element managers, and
19 a request reception section for receiving a
20 request for a target QoS capability, and
21 a selection and notification section for
22 selecting a candidate subnetwork having a QoS
23 capability such as to satisfy the target QoS
24 capability, for which the request has been received
25 by said request reception section, based on the

26 various QoS capabilities being managed by said
27 management section, and for notifying said element
28 manager corresponding the selected candidate
29 subnetwork of selection information indicating that
30 the candidate subnetwork has been selected;
31 each said element manager further having a control
32 section for controlling the corresponding subnetwork based
33 on the selection information notified by said selection and
34 notification section of said network manager.

1 2. A system for managing a communication network
2 composed of a plurality of subnetworks, comprising:
3 a plurality of element managers provided one for each
4 of the plural subnetworks for individual management
5 thereof; and
6 a network manager accommodating said plural element
7 managers for concentrated management thereof;
8 each of said plural element managers having a
9 collection and notification section for collecting QoS
10 (Quality of Service) capability management information on
11 the corresponding element manager and notifying said
12 network manager of the collected QoS capability management
13 information;
14 said network manager having
15 a management section for concentratedly managing various
16 QoS capabilities of the whole communication network, based
17 on the QoS capability management information collected and

18 notified by the individual element managers.

1 3. An element manager for use in a communication
2 network managing system, which manages a communication
3 network composed of a plurality of subnetworks and includes
4 a plurality of element managers corresponding to the plural
5 subnetworks and a network manager accommodating the plural
6 element managers, said element manager comprising:

7 a collection and notification section for collecting
8 QoS (Quality of Service) capability management information
9 to be used in managing the corresponding subnetwork, and
10 for notifying the network manager of the collected QoS
11 capability management information; and

12 a control section for controlling the corresponding
13 subnetwork based on information which is obtained by the
14 network manager having a function of concentratedly
15 managing QoS capabilities of the communication network
16 based on said QoS capability management information
17 collected and notified by said collection and notification
18 section and which is notified from the network manager on
19 the candidate subnetwork having a QoS capability such as
20 to satisfy a target QoS capability for the corresponding
21 subnetwork.

1 4. An element manager for use in a communication
2 network managing system, which manages a communication
3 network composed of a plurality of subnetworks and includes

4 a plurality of element managers corresponding to the plural
5 subnetworks, and a network manager accommodating the plural
6 element managers,

7 wherein said element manager has a collection and
8 notification section for collecting QoS capability
9 management information to be used in managing the
10 corresponding subnetwork, and for notifying the network
11 manager of the collected QoS capability management
12 information.

1 5. A network manager for use in a communication
2 network managing system, which manages a communication
3 network composed of a plurality of subnetworks and includes
4 a plurality of element managers corresponding to the plural
5 subnetworks, and a network manager accommodating the plural
6 element managers, said network manager comprising:

7 a management section for concentratedly managing
8 various QoS (Quality of Service) capabilities of the whole
9 communication network, based on QoS capability management
10 information of the corresponding subnetworks, which
11 information has been collected and notified by the
12 individual element managers;

13 a request reception section for receiving a request
14 for a target QoS capability; and

15 a selection and notification section for selecting
16 a candidate subnetwork having a QoS capability such as to
17 satisfy the target QoS capability, for which the request

18 has been received by said request reception section, based
19 on the various QoS capabilities being managed by said
20 management section, and for notifying the element manager
21 corresponding to the selected subnetwork of selection
22 information that the candidate subnetwork has been
23 selected.

1 6. A network manager for use in a communication
2 network managing system which manages a communication
3 network composed of a plurality of subnetworks and includes
4 a plurality of element managers corresponding to the plural
5 subnetworks, and a network manager accommodating the plural
6 element managers,

7 wherein said network manager has a management section
8 for concentratedly managing various QoS (Quality of
9 Service) capabilities of the whole communication network,
10 based on QoS capability management information of the
11 corresponding subnetworks, which information has been
12 collected and notified by the individual element managers.

1 7. A network manager for use in a communication
2 network managing system according to claim 5, wherein said
3 management section is constructed to concentratedly manage
4 the various QoS capabilities of said communication network
5 and those of another communication network independent of
6 the last-named communication network in view of also QoS
7 capability management information of other subnetworks

8 that constitute said another communication network.

1 8. A network manager for use in a communication
2 network managing system according to claim 5, wherein said
3 management section is constructed to manage supported
4 tagging, as additional information, for discrimination on
5 combination of the subnetworks.

1 9. A network manager for use in a communication
2 network managing system according to claim 5, wherein said
3 management section is constructed to update the various QoS
4 capabilities of the communication network when said QoS
5 capability management information is updated.

1 10. A network manager for use in a communication
2 network managing system according to claim 5, wherein said
3 selection and notification section is constructed to
4 previously select two or more of the subnetworks when
5 selecting the candidate subnetworks having communication
6 QoS capabilities such as to individually satisfy the target
7 QoS capability, for which the request has been received by
8 said request reception section, to firstly notify one
9 element manager, corresponding to a first one of the
10 candidate subnetworks, of the previous selection of the
11 plural subnetworks and secondly notify another element
12 manager, corresponding to a second one of the candidate
13 subnetworks, of unable information that the corresponding

14 subnetwork cannot be controlled, upon receipt of the unable
15 information as a response from the element manager
16 corresponding to the first candidate subnetwork.

1 11. A network manager for use in a communication
2 network managing system according to claim 5, wherein said
3 selection and notification section is constructed to select
4 two or more of the subnetworks according to preset
5 priorities when selecting the candidate subnetworks having
6 QoS capabilities such as to individually satisfy the target
7 QoS capability, for which the response has been received
8 by said request reception section, and to notify one element
9 manager, corresponding to a higher-priority one of the
10 candidate subnetworks, of the selection.

1 12. A computer-readable recording medium in which
2 a program is recorded for instructing a computer to be used
3 in a communication network management system including a
4 plurality of element managers corresponding to a plurality
5 of subnetworks that constitute a communication network, and
6 a network manager accommodating the plural element managers,
7 wherein said program instructs said computer to function
8 as the following:

9 collecting and notifying means for collecting QoS
10 (Quality of Service) capability management information on
11 the corresponding element manager and notifying said
12 network manager of the collected QoS capability management

13 information; and
14 control means for controlling the corresponding
15 subnetwork based on information which is obtained by the
16 network manager having a function of concentratedly
17 managing various QoS capabilities of the whole
18 communication network based on said QoS capability
19 management information collected and notified by said
20 collecting and notifying means and which is notified from
21 the network manager on the candidate subnetwork having a
22 QoS capability such as to satisfy a target QoS capability
23 for the individual subnetwork.

1 ~~13.~~ A computer-readable recording medium in which
2 a program is recorded for instructing a computer to be used
3 in a communication network managing system including a
4 plurality of element managers corresponding to a plurality
5 of subnetworks that constitute a communication network, and
6 a network manager accommodating the plural element
7 managers,

8 wherein said program instructs said computer to
9 function as collecting and notifying means for collecting
10 various QoS capability management information on the
11 individual element managers and notifying said network
12 manager of the collected QoS capability management
13 information.

1 ~~14.~~ A computer-readable recording medium in which

2 a program is recorded for instructing a computer to be used
3 in a communication network managing system including a
4 plurality of element managers corresponding to a plurality
5 of subnetworks that constitute a communication network, and
6 a network manager accommodating the plural element managers,
7 wherein said program instructs said computer to function
8 as the following:

9 managing means for concentratedly managing various
10 QoS (Quality of Service) capabilities of the whole
11 communication network, based on QoS capability management
12 information of the corresponding subnetworks, which
13 information is collected and notified by the individual
14 element managers;

15 request receiving means for receiving a request for
16 target QoS capability; and

17 selecting and notifying means for selecting a
18 candidate subnetwork having a QoS capability such as to
19 satisfy the target QoS capability, for which the request
20 has been received by said request receiving means, based
21 on the QoS capabilities being managed by said managing means,
22 and for notifying the element manager corresponding the
23 selected subnetwork of selection information that the
24 candidate subnetwork has been selected.

1 15. A computer-readable recording medium in which
2 a program is recorded for instructing a computer to be used
3 in a communication network management system including a

4 plurality of element managers corresponding to a plurality
5 of subnetworks that constitute a communication network, and
6 a network manager accommodating the plural element
7 managers,

8 wherein said program instructs said computer to
9 function as managing means for concentratedly managing
10 various QoS (Quality of Service) capabilities of the
11 network, based on QoS capability management information of
12 the corresponding subnetworks, which information has been
13 collected and notified by the individual element managers.

1 16. A network manager for use in a communication
2 network managing system according to claim 7, wherein said
3 management section is constructed to manage supported
4 tagging, as additional information, for discrimination on
5 combination of the subnetworks.

1 17. A network manager for use in a communication
2 network managing system according to claim 16, wherein said
3 management section is constructed to update the various QoS
4 capabilities of the communication network when said QoS
5 capability management information is updated.

1 18. A network manager for use in a communication
2 network managing system according to claim 8, wherein said
3 management section is constructed to update the various QoS
4 capabilities of the communication network when said QoS

5 capability management information is updated.

1 19. A network manager for use in a communication
2 network managing system according to claim 6, wherein said
3 management section is constructed to concentratedly manage
4 the various QoS capabilities of said communication network
5 and those of another communication network independent of
6 the last-named communication network in view of also QoS
7 capability management information of other subnetworks
8 that constitute said another communication network.

1 20. A network manager for use in a communication
2 network managing system according to claim 19, wherein said
3 management section is constructed to manage supported
4 tagging, as additional information, for discrimination on
5 combination of the subnetworks.

1 21. A network manager for use in a communication
2 network managing system according to claim 20, wherein said
3 management section is constructed to update the various QoS
4 capabilities of the communication network when said QoS
5 capability management information is updated.

1 22. A network manager for use in a communication
2 network managing system according to claim 6, wherein said
3 management section is constructed to manage supported
4 tagging, as additional information, for discrimination on

5 combination of the subnetworks.

1 23. A network manager for use in a communication
2 network managing system according to claim 22, wherein said
3 management section is constructed to update the various QoS
4 capabilities of the communication network when said QoS
5 capability management information is updated.

1 24. A network manager for use in a communication
2 network managing system according to claim 6, wherein said
3 management section is constructed to update the various QoS
4 capabilities of the communication network when said QoS
5 capability management information is updated.